SF 2.1

Monsanto

DETERGENTS/PHOSPHATES DIVISION

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May 11, 1994

Mr. Tim Brincefield
Remedial Project Manager
U.S. Environmental Protection Agency
1200 Sixth Avenue, HW-113
Seattle, Washington 98101

RE: COMMENTS ON MONSANTO DRAFT HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

Dear Mr. Brincefield:

Monsanto Company thanks you for the opportunity to review and prepare comments on the Draft Human Health and Ecological Risk Assessment prepared for the Monsanto Soda Springs facility. We appreciate you sharing these reports with us and hope that you find our comments informative and constructive as you finalize the documents. The attached specific comments were developed by Monsanto Staff and Golder Associates Inc. Where possible, we have tried to provide alternative language and constructive comments to assist EPA and its contractor in incorporating our comments into the reports.

In general, both reports are well organized and easy to read. The reports follow the general risk assessment framework as delineated in EPA's risk assessment guidance.

However, Monsanto is concerned that portions of both reports are technically questionable and depart from standard EPA procedures in a number of areas, including but not limited to:

- Selection and application of exposure factors;
- Uncertainty analysis;
- Consideration of bioavailability of constituents from various media;
- Selection and application of toxicity factors, and
- Determination of ecological assessment endpoints.

Monsanto strongly objects to EPA's refusal to recognize the legal jurisdiction and protective standards of OSHA levels for worker exposure at the Soda Springs Plant. Unlike most NPL sites, Monsanto Soda Springs is an operating facility and is an OSHA Merit (soon to be Star) facility.

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Monsanto believes EPA has no legal authority regarding gamma radiation under CERCLA, as it does not constitute a release to the environment. In addition, Monsanto is concerned regarding the traditional radiation risk assessment approach used in the reports. This approach is inconsistent with the principles for developing Graded Decision Guidelines as recommended by the Science Advisory Board for the community slag issue.

These issues will be addressed in separate communication between Monsanto and EPA attorneys.

Monsanto looks forward to a future meeting EPA and its contractor to discuss these comments in more detail and to resolve any outstanding issues.

Thank you for the opportunity to comment on the draft risk assessment reports.

Sincerely,

for David Saunton

Robert L. Geddes
Superfund Project Coordinator

Attachments

REVISED PRELIMINARY COMMENTS ON THE EPA DRAFT BASELINE HUMAN HEALTH AND ECOLOGICAL ASSESSMENT FOR MONSANTO CHEMICAL CORPORATION, SODA SPRINGS, IDAHO (PERFORMED BY SAIC FOR EPA REGION 10).

Note: Specific comments on this risk assessment are limited to concerns regarding analysis or interpretation of risks, and do not reflect typographical, grammatical, or formatting errors.

As a general comment, we found it difficult to re-create many of the data tables presented in both reports. It would be helpful to provide Appendices including the specific data used for each table and a detailed description if particular data were omitted.

Human Health Risk Assessment

1. Executive Summary, p. ix, para. 6. "Actual" exposures are not evaluated for either workers or residents in this risk assessment. The exposures that are evaluated in this risk assessment are the potential risks and are result of conservatively modeled scenarios, using conservative assumptions.

2. Executive Summary, p. x, para. 2. Please refer to the cover letter regarding EPA's assessment of on-site risks. It is not clear which on-site risks are the purview of OSHA, and which are the purview of EPA. These should be defined *a priori*.

   para. 4. A brief, but specific, interpretation of "risk" should be provided. The RME risk from exposure to carcinogens may be defined as "an upper-bound estimate of the excess risk of cancer resulting from exposure to a cancer-causing agent, averaged over a lifetime." The RME hazard resulting from exposure to systemic toxins may be defined as "a conservative comparison of a dose of a noncarcinogenic agent with an estimate of a dose of that agent which would not be expected to result in adverse effects in a sensitive individual."

3. Executive Summary, p. xi, para. 1. Based on the latest information, the nearest residence is no longer the Jorgensen residence (250 feet south of the Monsanto fence line). This land has been purchased by Monsanto. The nearest residences are now the Cellan (one half mile to the west) and Humble residences (3/4 mile to the south).

4. Section 1.0, p. 1, para. 5. There are presently 46 monitoring wells and numerous springs and production wells being used to monitor groundwater quality.

5. Figure 1-2, p.3. The figure should be modified to illustrate the true extent and flow direction of the groundwater plume originating from Monsanto, as well as the geological fault separating the Monsanto and Kerr-McGee plumes. It is not necessary to include the Kerr-McGee plume on this map. Please refer to the memorandum on Groundwater Quality dated October 29, 1993.

6. Section 1.4, p.6., para. 1. Please refer to the cover letter regarding EPA's assessment of on-site risks. The purview of OSHA, as opposed to EPA, is not defined.

7. Section 1.4, p.6, para. 2. The acknowledgment that the slag issue is beyond the scope of this assessment reflects a realistic approach to assessing risks at this site.

   para. 3. The likelihood of a receptor being exposed to groundwater impacted by plumes originating from Monsanto and Kerr-McGee is not discussed. These plumes are geologically separate, and it would be extremely unlikely that a particular receptor would be exposed to both. This extremely small likelihood should be acknowledged.

   para. 4. The statement that "sufficient data was available to perform this assessment" is accurate, and reflects good risk assessment practice.

8. Section 1.5, p.7, para 3. The effect of the key assumptions should be elucidated; *e.g.* "These assumptions effectively increase the conservatism of hazard and risk estimates."

9. Section 2.1, p. 9, para. 3. The acknowledgment that human ingestion of sediments or spring water within the Soda Creek drainage is not a major exposure pathway of concern reflects a realistic approach to assessing risks at this site.

10. Section 2.1, p. 10, para. 4. Please refer to the cover letter regarding EPA's assessment of on-site risks. The means of evaluation of exposures to gamma radiation from radionuclide constituents are unclear. This section implies that the method in Appendix E is used, and total gamma radiation is evaluated. If so, it is unclear as to the reason gamma radiation is not evaluated as an incremental risk. Evaluation of total risk from all sources of gamma radiation is inappropriate, in that it does not result in an estimate of an RME incremental cancer risk.

    However, the tables in Section 5 (Risk Characterization) seem to indicate that a slope factor approach was used. The relationship between the slope factor approach and the Appendix E approach is unclear, and should be clarified. The results that led to conclusions regarding a particular level of risk from gamma radiation exposure should be clearly identified.

11. Section 2.3, p. 11. Background groundwater samples should be taken from wells hydraulically upgradient within the flow system of interest. This would include TW-57, TW-28/29, TW-48 and TW-15. Formation Spring is hydraulically upgradient of the flow system affected by Kerr-McGee.

12. Section 2.4, p. 11. Equations and assumptions used for determining RBCs should be given in the text and/or in Appendix A.

    para 2. A reference should be provided for the Region 10 guidance.

    The acknowledgment that Formation and Ledger Springs are not impacted by the industrial facilities accurately reflects site conditions, and should be included in the text, not as a footnote.

13. Section 2.5, p. 12, para. 1. TW-56 is not affected by Monsanto. It is on the east side of the main fault and could be affected by Kerr-McGee.

14. Table 2-1, p.13. Constituents that are not COPCs (labeled as NE) should not appear in this table. The period of record for the maximum concentration should be provided. A table listing the data used would be helpful. The maximum background concentration should be modified per the earlier comment regarding the applicability of Formation and Ledger Springs.

15. Section 3.0, p. 18, para 4. Please refer to the cover letter regarding EPA's assessment of on-site risks. No reason is given for only evaluating the industrial RME scenario, as opposed to both AVG and RME scenarios. At a minimum, the industrial AVG scenario should be evaluated, in that this provides a crude form of quantitative uncertainty analysis.

16. Section 3.1.1, p. 19, para. 2. The possibility and/or likelihood of a hypothetical future resident being exposed to the groundwater plume should be addressed. See comments #5 and #7.

17. Section 3.1.2, p. 19, para. 1. The acknowledgment that "storm water runoff does not result in surface water leaving the Plant" accurately reflects site conditions.

    para. 2. The acknowledgment that human exposure to Soda creek water and sediments is highly unlikely accurately reflects site conditions.

18. Section 3.1.3, p. 20, para. 1. The acknowledgment of grain ingestion and food-chain transfer as minor exposure routes accurately reflects site-specific conditions. As part of on-going Plant improvements, Monsanto is currently reviewing the management of underflow solids.

19. Section 3.1.4, p. 20, para. 3. The "rule of thumb" and RESRAD approaches should be briefly defined. Also, it is unclear as to what "excessive uncertainty" means, why this is undesirable in the RESRAD model, and why this invalidates the model. This statement should be either be clarified or deleted.

20. Section 3.1.4, p. 21, para. 1. The statement that "potential exposure to radon will *always* be linked to radium-226+D in soils or source materials" is erroneous. Formation of radon from radium and exposure to that radon are separate processes. It would be more accurate to replace "always" with "sometimes".

21. Section 3.3, p. 23, para. 2. If large uncertainties exist, the need for quantification is increased. This does not imply in any way that further data collection is required for an informative uncertainty analysis.

22. Section 3.3.1, p. 24, table (unlabeled). Please refer to the cover letter regarding EPA's assessment of on-site risks. This table does not reflect the information provided by Bob Geddes (memo to EPA dated December 6, 1993). This information was provided by Monsanto to assist EPA in its information-gathering efforts, and should be used if on-site risks are to be evaluated. Increasing a worker's exposure time to underflow solids, for example, from 2 to 8 hours does not account for "variability between tasks". If interpolations are made, the modifications and reasons for doing so should be explained.

23. Section 3.3.1, p.24, para. 2. Please refer to the cover letter regarding EPA's assessment of on-site risks. EPA provides a default shielding factor of 0.2 for structures (effectively 1 – 0.2 = 0.8) (EPA 1991, *Risk Assessment Guidance for Superfund, Volume 1 - Human Health Evaluation Manual: Part B*). Since the majority of on-site tasks involve being in a large enclosed vehicle, it is overly conservative to ignore this factor in determining an RME. The actual shielding factor is likely to be more than the default value. Also, it is unclear as to how overly conservative estimates of gamma exposures, which ignore shielding factors and are additive rather than incremental (see comment #10), provide "sufficient information for decision makers." The limitations of interpretation of such estimates of exposures should be discussed.

24. Section 3.3.2, p. 24, para. 1. Please refer to the cover letter regarding EPA's assessment of on-site risks. The likelihood of an industry or business (other than the current facility) being sited on the Plant property, as well as a timeline for this event, should be discussed. The current facility does not plan to close for at least several decades. If the facility is shut down in the future, closure will be addressed at that time.

    para. 2. The acknowledgment that "residential use of this facility in the foreseeable future is considered extremely unlikely" accurately reflects future-use scenarios.

25. Tables 3-2a and 3-2b, p. 25. Exposure factors should be referenced. Reasoning for assuming a gamma shielding factor of 0.0 (footnote c) should be provided.

26. Section 3.3.3, p. 26, para. 1. See comment #3 regarding the closest current residents.

    para. 2. The exclusion of garden produce as a major exposure pathway accurately reflects site-specific conditions.

27. Section 3.3.4, p. 26, para 2. See comments #5 and #7.

28. Table 3-3, p. 27. The sources for exposure factors are missing. The exposure factors should reflect current EPA guidelines.

    The derivation of the "integrated intake factor" for the soil ingestion factor in unclear. It is apparently a weighted average of soil ingestion rates, but the assumptions implicit in the intake factor are not given. Also, body weight is implicit in the intake factor, and does not need to be given in the table.

    Body weight under the dust inhalation pathway should be 70 kg in the RME scenario, since the inhalation rate reflects adult exposures. It is also unclear as to why body weight is broken down into child and adult categories under the AVG scenario, since only adults are being evaluated.

    The exposure duration under the AVG scenario is broken down into child and adult categories, and equals 15 years (as opposed to 9 years for soil ingestion). The reason for this is unclear.

    It is unclear as to whether the gamma shielding factor is used in the residential scenario equations, or if it is ignored, as in the industrial scenario equations. See comment #23.

    Risk values for the residential scenario should be checked, and recalculated if the values in this table were used.

29. Section 3.4, p. 28, para. 1. It is unclear as to the reason site concentrations are assumed to be normally distributed. Spatial distribution of these concentrations tends toward lognormality (see the Golder RI report).

30. Section 3.4.2, p. 31, para. 1. The residences named should appear in Figure 3.3 ("Cellan" should be spelled "Cellan"). Also, the use of fence-line soil samples is inappropriate for a residential scenario. Monsanto owns that property, and has no plans to allow residential development. The extremely low likelihood of residential exposures to constituent concentrations present in on-site wells should be addressed.

31. Section 3.4.3, p. 31, para. 1. It is not "difficult to perform useful statistical analyses on data sets of less than 10 samples". Uncertainty (lack-of-knowledge) may be determined subjectively. Indeed, small data sets may well-characterize constituent distributions in many instances. Examples are the distributions of background levels of constituents at this site; additional sampling did not change or improve the distributions. This is a minor source of uncertainty in the risk models and should be identified as such.

32. Section 3.5, p. 35, 36. There is no consideration of bioavailability of constituents in different media, particularly soil. This is necessary to convert intakes to absorbed doses.

(see SAIC Baseline Risk Assessment for Ruston/North Tacoma, section 4.4.3). If bioavailability is not to be considered, the effect of this omission and justification should be provided in the text.

33. Table 4-1, p. 39. The critical effects for beryllium and vanadium RfDs are unknown, according to *IRIS* and *HEAST*. The critical effect for the fluoride RfD is cosmetic fluorosis of teeth in children, not skeletal fluorosis, according to *IRIS* and *HEAST*.

34. Table 4-2, p. 39. The appropriate inhalation slope factor for arsenic is 15 (as calculated from the inhalation unit risk provided in *IRIS*). EPA's derivation of the slope factor (50) in *HEAST*, which is shown in the table, incorporates bioavailability of inhaled arsenic (30%). If this slope factor is to be used, the exposure side of the risk equation must also be adjusted to reflect bioavailability (see SAIC Baseline Risk Assessment for Ruston/North Tacoma, section 4.4.3). Risks resulting from inhalation of arsenic should be recalculated.

35. Section 4.2.1, p. 40, para. 3. The use of the uranium-238+D slope factor is inappropriate. The form of uranium present at the Soda Springs site is natural uranium, which is a mixture of U-238, U-234, and U-235. A mass- and specific activity-weighted average slope factor should be used. Additionally, the slope factors for U-238+D in *HEAST* are erroneous. The 1994 *HEAST* will include corrected slope factors, which are available upon request from EPA. Risks resulting from exposure to uranium should be recalculated.

36. Section 4.3, p. 41, para. 1. It is unclear as to why arsenic and vanadium hazards may be added, since the critical effects that the RfDs are based on are totally different. Also, it is unclear as to why inhalation hazard quotients of arsenic, cadmium, and vanadium may be added, or even calculated, since inhalation RfDs, and therefore critical effects, do not currently exist for these constituents.

37. Section 5.1, p. 42, para. 1. There is no mention of the extrapolation models used to calculate SFs; discussion of uncertainties in these models is critical. Language such as, "slope factors for carcinogens are usually derived by applying deterministic human exposure factors to unit risks derived from extrapolation models applied to data from animal or human studies. There is a large amount of uncertainty associated with each step of this derivation" should be added. Also, the SF is an estimate of the slope of either the maximum likelihood estimate of an extrapolation model, or the slope of the upper 95 percent confidence limit of the maximum likelihood estimate of an extrapolation model (*e.g.*, the arsenic SF is based on a maximum likelihood estimate).

38. Section 5.1, p. 43, para. 2. Risks from chemical carcinogens may also not be directly comparable. Additivity is often assumed, but interactions may be antagonistic or synergistic.

39. Section 5.1, p. 43, para. 3. The definition of an SF should be corrected to "an estimate of the slope of either the maximum likelihood estimate of an extrapolation model, or the slope of the upper 95 percent confidence limit of the maximum likelihood estimate of an extrapolation model".

    para. 5. The definition of an RfD should be corrected to "a (usually chronic) dose which would not be expected to result in adverse effects in a sensitive individual."

    The definitions in the acronym list (p. vii) should also be corrected.

40. Section 5.2, p. 44. The "selection of a Contaminant of Concern. . ." criteria are unclear. The RME incremental lifetime cancer risk is never greater than the background lifetime cancer risk (which is about 1 in 3, according to the American Cancer Society).

41. Section 5.3.2, p. 49, para. 1. Please refer to the cover letter regarding EPA's assessment of on-site risks. Also, see comment #24.

42. Section 5.3.3, p. 49. "Background risks" should be defined as the incremental lifetime cancer risks which result from exposures to background levels of soil constituents (see comment #40).

43. Section 5.4, p. 54, para. 1. The RME concept should be clearly defined, *e.g.* "the estimated conservative upper-bound hazards and excess lifetime cancer risks presented below apply to a hypothetical random individual within a particular scenario, and result from conservative upper-bound estimates of exposures, combined with conservative upper-bound estimates of toxicity."

44. Section 5.4.2,. p. 57, para. 6. See comments #5 and #7.

45. Section 5.6, pp. 62-65. This section represents a cursory overview of the large amount of uncertainty that is associated with assessing health risks at this site. An example is the uncertainty and probability associated with a resident actually living at the plant fence-line. The EPA 1992 Guidelines for Exposure Assessment (Section 6), EPA Region III 1994 guidance - "Use of Monte Carlo Simulation in Risk Assessments", and the EPA Exposure Factors Handbook, for example, provide guidance for qualitative discussion of different sources of uncertainty (uncertainty characterization), as well as methodologies for quantitative assessment of uncertainty. Quantitative uncertainty assessment can and should be performed, and provides useful information, when a large amount of uncertainty exists in a scenario, model, or parameters of a model. The main reason for performing quantitative uncertainty analysis is to provide risk managers with better information with which to make decisions. This section needs to be expanded in order to meet that need.

46. Section 5.6.4, p. 65. The text provides a very limited quantitative uncertainty assessment of one pathway in one exposure scenario. This should be expanded to incorporate analysis of the uncertainty in all risk estimates that would be expected to be

incorporated in a risk management decision (*i.e.*, those that exceed 1E-4 incremental lifetime cancer risk, or an HI of one). Table 5-8 does not adequately represent the results of an uncertainty analysis, and should be modified or deleted (also see comment #53).

47. Section 6.0, p. 69, para. 3. The estimates of cancer risk calculated in this risk assessment should be presented as "deterministic upper bound estimates of the incremental lifetime cancer risk to a random individual who is exposed to carcinogens". It is not possible to calculate the actual probability of developing cancer using the methodology in this risk assessment. The actual incremental lifetime cancer risk to an actual individual is probably lower than the RME risk, and may indeed be zero.

    Section 6.0, p. 69, para. 6. The statement "Each of the current residents are at risk . . ." should be changed to reflect the definition of risk given in comment #44. It is not possible to calculate the risk to each resident using the methodology in this risk assessment.

48. Section 6.0, p.70, para. 1. See comment #48.

49. Section 6.0, p. 70, para. 4. See comments #5 and #7.

50. Section 6.0. p. 70, para. 5. See comment #48.

51. Appendix E. See comment #10.

52. Appendix F. The inclusion of a probabilistic quantitative uncertainty analysis in this risk assessment reflects good risk assessment practice using state-of-the-art tools. However, the description of a "probabilistic risk assessment" does not describe the methodology used for quantitative uncertainty analysis in this appendix. This description reflects a type of deterministic fault tree analysis mainly used (in the past) in the nuclear industry to calculate probabilities of catastrophic events. The description does not accurately reflect the type of stochastic uncertainty assessment that appears in the remainder of the appendix.

    Monte Carlo simulation is a useful and informative way to conduct quantitative uncertainty analyses. However, the analysis provided here is difficult to interpret.

    The derivation of exposure models and variable contributions is questionable. The output distributions of risk reflect inclusion of unrealistically narrow, conservatively biased distributions into overly simplistic models. There are no references in the appendix, and no support is given for the distributions; thus, the model outputs are not defensible.

    There does not appear to be any subtraction of background levels of constituents; therefore, the models do not result in estimates of incremental lifetime cancer risks. The output of these models is therefore not comparable to the deterministic estimates of ILCR.

The distribution used for averaging time appears to be equivalent to that used for exposure duration. If this is the case, this runs counter to EPA's reasoning for using averaging time in carcinogenic risk equations. The purpose of averaging time is to average exposures over the lifetime of the individual. This concept is used in slope factor derivation. It is inappropriate to use a distribution for averaging time in a risk equation, if the same is not done in a slope factor equation.

Additionally, the model appears to divide the distribution for exposure duration by the distribution for averaging time (which is the same distribution), with no specified correlation between the two (a correlation may have been specified, but this correlation is not given in the text. If a perfect positive correlation were specified, the two distributions would cancel, with a resulting spurious decrease in the variance of the output distribution). This error results in unlikely scenarios; *e.g.* someone who lives for 1 year, yet is exposed for 50 years. The distributional result is a highly skewed distribution with an infinite tail to the right (50 divided by 0 would be the maximum value). The net effect on the risk distribution is to greatly exaggerate the risk. The results shown in Table 5-8 (p. 65 in text) are largely explained by this exaggeration. The 95th percentile of an exaggerated risk distribution would be expected to match the deterministic results more closely than the 95th percentile of an unbiased risk distribution.

EPA provides useful guidance on quantitative uncertainty analysis and Monte Carlo simulation (*e.g.*, the EPA 1992 Guidelines for Exposure Assessment: Section 6, the EPA Exposure Factors Handbook, and EPA Region III 1994 guidance - "Use of Monte Carlo Simulation in Risk Assessments").

Ecological Risk Assessment

1. Executive Summary, p. vi, para. 5. A figure should be presented which delineates the area mentioned in this paragraph.

2. Executive Summary, p. vii, para. 3. The definition of "assessment endpoints" should be referenced. "Ecosystem risks" should be defined, although the results of this assessment do not reflect risks to an entire ecosystem. The specific types of risks which are addressed in this document should be defined.

3. Section 1.4.1, p. 4. The species which exist in undisturbed areas are irrelevant in terms of evaluation of potential ecological impacts resulting from activities at the Soda Springs plant. The plant is surrounded by agricultural and range land, which is not undisturbed. The area which is being evaluated for ecological effects resulting from Plant activities should be clearly defined in the text and on a site map. If species only occur outside this area, they should be deleted from the report.

4. Section 1.4.2, pp. 4, 5. The "significant" habitats which are listed, other than Soda Creek, are irrelevant in terms of evaluation of potential ecological impacts resulting from activities at the Soda Springs plant (see comment #3).

5. Section 1.4.3, p. 6. See comment #3.

6. Section 1.5, p. 6, para. 4. The ecosystem which is being evaluated should be defined. Within that context, the "health" of agricultural and range land should be defined. The land area which is being evaluated should be delineated (see comment #3).

   para 2. The Kerr-McGee plant is noted as being beyond the scope of this assessment; yet, the human health assessment evaluates impacts from that plant. The reasoning behind this should be discussed.

   p. 7, para. 1. The specific endpoints which are the subject of modeling or measurement and subsequent risk characterization should be listed.

7. Section 1.6, pp. 7,8. This section appears unnecessary and should be deleted (see comment #6).

8. Section 2.1.2, Figure 2-4. This figure is not informative and should be deleted.

9. Section 2.2.1, para. 1. Spring waters should be compared to groundwater upgradient within the same flow system, i.e., TW-57, not Formation or Ledger Springs. Table 2-3 should be modified accordingly.

10. Section 3.1, p. 23, para. 3. The reference to Ted Norton should be deleted. The reference refers to Blackfoot Reservoir, not Soda Creek.

    Section 3.1, p. 23, para. 6. The Northwest Pond does not contain water. Neither it or the seal water pond are "attractive nuisances" for water fowl.

11. Section 3.1, p. 24, para. 1. The determination of "the major exposure pathways" is obscure. The reasoning which led to this conclusion should be elucidated.

12. Section 3.2, p. 24, para. 2. The observations of blowing dust and saltation need to be substantiated by dates, durations, weather conditions, etc.

13. Section 3.2.1, p. 26, para. 1. The reason phytoxicity is evaluated should be elucidated. The previous section stated that there was no evidence of vegetative stress other than that induced by grazing. Also, the endpoints subject to evaluation should be defined; *e.g.* individual plants, communities of plants, or the larger ecosystem.

    para. 3. The sediment criteria which are referenced (listed in Table 4-5) are not applicable to this area. These criteria were developed for aquatic systems in the Midwest, which have different sediment and water chemistries and different biota. Regulatory and/or scientific justification for the use of these criteria should be provided.

14. Section 3.2.2, p. 27. The assessment endpoint should be elucidated; *e.g.* individual mice, mouse community.

15. Section 3.2.3, p. 27. See comment #14.

16. Section 3.3.1, p. 28. References for the values given should be provided.

    There is no consideration of bioavailability of constituents from soil and food, yet bioconcentration is addressed. Bioconcentration does not occur without absorption.

17. Section 3.3.2, p. 29. There is no consideration of bioavailability of constituents from water.

18. Section 3.3, pp. 29, 30. This section should be expanded considerably to incorporate the different sources of uncertainty inherent in an exposure assessment, *e.g.* scenario definition, model derivation, and parameter derivation. Quantification of uncertainty should be performed. EPA's 1992 Framework for Ecological Risk Assessment provides suggestions regarding methods for uncertainty analysis.

19. Section 4.1, p. 31. The endpoints being evaluated should be elucidated. Also, Section 2.1.1 states that gamma readings outside the plant did not exceed background; it is unclear as to why that exposure route appears here.

    Section 4.2, p. 32, para. 3, 4. It is unclear as to whether acute, chronic, or subchronic endpoints are being assessed. Appropriate toxicity reference values should be derived based on the assessment endpoints.

20. Table 4-1, p. 33. COPC-specific references should be given, and the derivation of the table values should be provided.

21. Table 4-3, p. 35. The derivation of the reference values is unclear. A formula in the text would be helpful. Also, the values are inconsistent; ranging from "no effect doses" to "maximum tolerated water concentrations", yet, the table is labeled "Acute Toxicological Reference Values". There appears to be no adjustment for interspecies differences. These inconsistencies should be corrected.

22. Section 4.2, p. 36, para. 3. The statement that "...exposure assumptions are sufficiently conservative to mitigate any uncertainty which would underestimate receptor-specific toxicity" should either be supported by inclusion of a quantitative uncertainty analysis, or deleted.

23. Section 4.6, p. 40. See comment #18.

24. Section 5.2.1, p. 46, para 2. "Safety factors" were not applied to mice and deer when extrapolating from other species, so it is unclear why this paragraph is included. Qualitative discussions of the effect of adding hypothetical safety factors to hypothetical ungulate risk evaluations in order to evaluate effects on carnivores and birds are not informative. This paragraph should be deleted.

25. Section 5.2.2, p. 46, para. 2. The sediment quality criteria which are used are inappropriate (see comment #13).

26. Section 5.5, p. 50. See comment #18.

27. Appendix A. See comment #3.

28. Appendix B. The sources for BCVs should be provided.

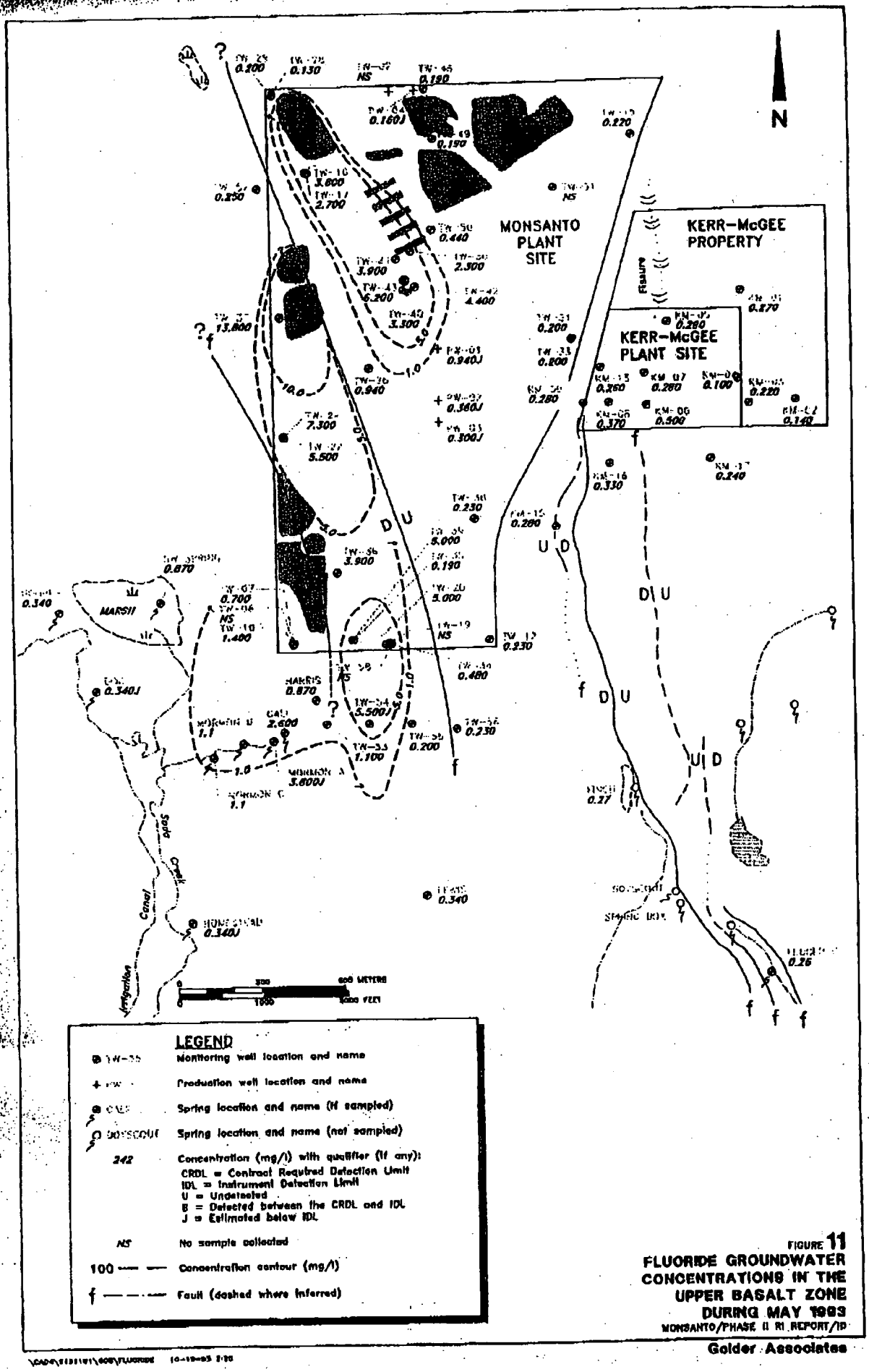

FIGURE 11
FLUORIDE GROUNDWATER CONCENTRATIONS IN THE UPPER BASALT ZONE DURING MAY 1993
MONSANTO/PHASE II RI REPORT/ID

Golder Associates

KERR-McGEE CHEMICAL CORPORATION
POST OFFICE BOX 478 • SODA SPRINGS, IDAHO 83276

May 9, 1994

Mr. R.L. Geddes
Senior Environmental Engineer
Monsanto Chemical Company
P.O. Box 816
Soda Springs, Idaho 83276

Re: Draft Baseline Risk Assessment

Dear Bob:

The Draft Baseline Risk Assessment has been reviewed by Kerr-McGee Chemical Corporation (KMCC) as you requested. The review was done from a consistency standpoint and not a purely technical one.

We are considered to be two Sites by EPA, but the referenced human health risk assessment includes references to the KMCC site. Figure 1-2 shows the contaminated ground water plume from the Monsanto site and the KMCC site. KMCC is also referenced in the text on pages 6 and 70. No where in the KMCC human health risk assessment is Monsanto mentioned. It was our understanding that this was a risk assessment for the Monsanto site and not a combined risk assessment.

The references to KMCC in the ecological risk assessment are found in the figures. In particular figures 1-1, 2-2, 2-3, and 2-4. In our ecological risk assessment Monsanto is shown in the figure depicting the likely exposure areas as a small entity and no impacts were implied.

The references to KMCC in your risk assessments (both human health and ecological) concerns us. We would like to have all references to the KMCC site removed from both documents. Please pass our concerns on to EPA as part of your comment package. As we discussed, you can send a copy of this letter to EPA. If you have any questions, please contact me at (208) 547-3331.

Sincerely,

Scott B. Sprague, P.E.
Staff Environmental Engineer

xc: R.A. Griffin
R.H. Jones
J.S. Brown - Dames and Moore